

## CLAIMS

We claim:

- 1           1.       A system for synchronizing playback of media content with other content or with host  
2 computer time information, the system comprising:  
3           a web browser for providing a timing representation to a media player;  
4           a media player implementing a first interface for object management and a second interface for  
5 exchanging timing and synchronization information with the web browser; and  
6           a player-hosting peer within the web browser for negotiating a playback state and a rendering  
7 status between the browser and the media player.
- 1           2.       The system of claim 1 wherein the player-hosting peer issues commands to the media  
2 player.
- 1           3.       The system of claim 2 wherein the media player notifies the player-hosting peer of  
2 media player state changes.
- 1           4.       The system of claim 1 wherein the second interface includes a playback state and a  
2 current playback time passed from the media player to the web browser.

1           5.       The system of claim 4 wherein the player and the player-hosting peer jointly maintain  
2   the playing state and the current playback time.

1           6.       The system of claim 1 wherein the second interface includes web browser time  
2   information and/or application time information passed from the browser to the media player.

1           7.       The system as in claim 1 wherein the player-hosting peer transitions through states  
2   including inactive, active, waiting for data, and out of sync.

1           8.       The system as in claim 7 wherein the player-hosting peer transitions from the inactive  
2   state to the active state upon receiving a media cued notification from the media player.

1           9.       The system as in claim 8 wherein the player-hosting peer transitions from the active  
2   state to the inactive state upon receiving a deactivate command from the browser.

1           10.      The system as in claim 8 wherein the player-hosting peer transitions from the active  
2   state to the inactive state upon receiving a change source command from the browser.

1           11.      The system as in claim 8 wherein the player-hosting peer transitions from the active  
2   state to the waiting for data state upon receiving a buffer empty notification from the media player.

1           12.     The system as in claim 11 wherein the player-hosting peer transitions from the waiting  
2     for data state to the active state upon receiving a buffer full notification from the media player.

1           13.     The system as in claim 11 wherein the player-hosting peer transitions from the waiting  
2     for data state to the active state upon receiving a seek command from the browser.

1           14.     The system as in claim 8 wherein the player-hosting peer transitions from the active  
2     state to the out of sync state upon detecting a sync lost condition.

1           15.     The system as in claim 14 wherein the player-hosting peer transitions from the out of  
2     sync state to the active state upon detecting a sync recovered condition.

1           16.     The system as in claim 14 wherein the player-hosting peer transitions from the out of  
2     sync state to the active state upon receiving a seek command from the browser.

1           17.     The system as in claim 1 wherein the media player transitions through states including  
2     no source, playing, seeking, and media done.

1           18.     The system as in claim 17 wherein the media player transitions from the no source  
2     state to the playing state upon completion of media cueing.

1           19.     The system as in claim 18 wherein the media player transitions from the playing state  
2     to the no source state upon receiving a change source command from the player-hosting peer.

1           20.     The system as in claim 18 wherein the media player transitions from the playing state  
2     to the seeking state upon receiving a seek command from the player-hosting peer.

1           21.     The system as in claim 20 wherein the media player transitions from the seeking state  
2     to the playing state upon completion of a seek operation.

1           22.     The system as in claim 18 wherein the media player transitions from the playing state  
2     to the media done state upon receiving a stop command from the player-hosting peer.

1           23.     The system as in claim 22 wherein the media player transitions from the media done  
2     state to the playing state upon receiving a start command from the player-hosting peer.

1           24.     The system as in claim 18 wherein the media player transitions from the playing state  
2     to the media done state upon finishing media playback.

1           25.     The system as in claim 24 wherein the media player transitions from the media done  
2     state to the playing state upon receiving a start command from the player-hosting peer.

1           26.     The system as in claim 1 wherein the media player notifies the player-hosting peer  
2 when media is ready for playback.

1           27.     The system as in claim 1 wherein the media player prepares for destruction upon  
2 receiving a deactivate command from the player-hosting peer.

1           28.     The system as in claim 1 wherein the media player changes from a first media source  
2 to a second media source upon receiving a change media source command from the player-hosting  
3 peer.

1           29.     The system as in claim 1 wherein the media player notifies the player-hosting peer of a  
2 buffer empty condition when media playback can not continue due to a media delivery problem.

1           30.     The system as in claim 29 wherein the media player notifies the player-hosting peer of  
2 a buffer full condition when the media delivery problem has been resolved and media playback can  
3 continue.

1           31.     The system as in claim 1 wherein the player-hosting peer notifies the player that the  
2 media playback time is out of sync with time information maintained by the player-hosting peer.

1           32.     The system as in claim 31 wherein the player-hosting peer notifies the player that  
2     synchronization has been regained between the media playback time and time information maintained  
3     by the player-hosting peer.

1           33.     The system as in claim 1 wherein the player-hosting peer passes commands from the  
2     browser to the player, the commands including play, stop, pause, resume, and seek.

1           34.     The system as in claim 1 wherein the player-hosting peer passes a seek command from  
2     the browser to the player to indicate that the player should jump to a specific time offset into media  
3     playback.

1           35.     The system as in claim 1 wherein the web browser is operating in a television set top  
2     environment.

1           36.     The system as in claim 1 wherein the other content includes advertising or other  
2     commercial content synchronized with at least one portion of the media content.

1           37.     The system as in claim 1 further comprising a proxy layer for passing synchronization  
2     information or commands or both synchronization information and commands between the browser  
3     and an external media player.

1           38.     The system as in claim 1 wherein the player-hosting peer implements an interface for  
2     providing access to timing information from the player-hosting peer.

1           39.     A method of synchronizing playback of media content with other content or with host  
2     computer time information, the method comprising the steps of:  
3             providing a timing representation to a media player;  
4             implementing a first media player interface for object management and a second media player  
5     interface for exchanging timing and synchronization information with a web browser; and  
6             issuing commands from the web browser to the media player, the commands being directed to  
7     media player operations other than, and in addition to, instantiation of the media player; and  
8             notifying the web browser of media player state changes.

1           40.     The method of claim 39 wherein the second media player interface includes a playback  
2     state and a current playback time passed from the media player to the web browser.

1           41.     The method of claim 40 wherein the player and the web browser both maintain the  
2     playing state and the current playback time.

1           42.     The method of claim 39 wherein the second media player interface includes the host  
2     computer time information passed from the browser to the media player.

1           43.     The method of claim 39 wherein the media player notifies the player-hosting peer  
2 when media is ready for playback.

1           44.     The method of claim 39 wherein the media player prepares for destruction upon  
2 receiving a deactivate command from the browser.

1           45.     The method of claim 39 wherein the media player changes from a first media source to  
2 a second media source upon receiving a change media source command from the browser.

1           46.     The method of claim 39 wherein the media player notifies the browser of a buffer  
2 empty condition when media playback can not continue due to a media delivery problem.

1           47.     The method of claim 46 wherein the media player notifies the browser of a buffer full  
2 condition when the media delivery problem has been resolved and media playback can continue.

1           48.     The method of claim 39 wherein the browser notifies the player that the media  
2 playback time is out of sync with time information maintained by the browser.

1           49.     The method of claim 44 wherein the browser notifies the player that synchronization  
2 has been regained between the media playback time and time information maintained by the browser.



1           50.     The method of claim 39 wherein the commands passed from the browser to the player  
2     include play, stop, pause, resume, and seek.

1           51.     The method of claim 39 wherein the browser passes a seek command to the player to  
2     indicate that the player should jump to a specific time offset into media playback.

1           52.     The method of claim 39 wherein the other content includes advertising or other  
2     commercial content synchronized with at least one portion of the media content.

1           53.     The method of claim 39 wherein the media player is external to the browser.

1           54.     The method of claim 39 wherein the step of providing a timing representation to a  
2     media player further comprises the step of implementing an interface to provide access to timing  
3     information from the web browser.